PERFORMANCE OF PRIVATE INVESTMENT IN PUBLIC ENTIT TRANSACTIONS – EVIDENCE FROM THE U.S.

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Abstract:

This paper examines the post-announcement stock performance of U.S. public firms which issue equity privately, analyzed by firm and transaction characteristics. We find that firms which issue equity privately with the use of common equity do perform significantly better than if they would with the use of convertibles. Furthermore, firms with a relative high investment in R&D, e.g. biotechnology firms, do significantly outperform the market. However, a substantial part of the outperformance is linked to industry specific factors. No evidence is found to confirm that private placements enable entrenchment for incumbent management.

Keywords: *Private placements*

1. Introduction

In the beginning of the new millennium, financial markets experienced a remarkable development: The rise of private investments in public entity, also known as 'PIPE', or in the academic literature as 'private placements'. Although the process started much earlier, the catalyst of this development was around 2000, the year of the dotcom stock bubble crash. After this devastating crash of the 'new economy', lots of companies were in trouble. Especially young, high technology firms saw their sources of funding dry up. Because these firms were listed on a stock exchange and their stock price had fallen dramatically, there was no eagerness for new issues. This was due to behaviour of both companies and investors. The companies which survived the crash did

not want to issue stock below their perceived true value. And if they would issue stock, they would be perceived to be a 'lemon', a company without future opportunities trying to make money fast. Even more importantly, the investors on their account were tired of

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investing in 'high technology' stocks, as these were perceived to be real crisis stocks. Their confidence in the stock markets had disappeared, and investors were increasingly shifting to low risk investments, like bonds or old economy stocks. Consequently, there was a severe deadlock in the financial markets.

This was a golden opportunity for the private investors. Private equity funds and wealthy individuals jumped in to offer funding for these firms more directly and more easily. All they need in exchange was some direct control and a nice discount. They also could, because of better information, determine if a firm was suitable for reanimation or not. Firms on their account had a good opportunity for alternative funding, and in this case would face no short-term problems when, for instance, they would experience severe cash flow volatility. Therefore, firms and private investors had both good reasons to take part in these PIPE transactions.

The importance of these 'shadow' markets has increased substantially, in consequence of the fact that normal stock exchanges did experience a decline in popularity after the bubble crash. Therefore, as the economic and societal impact of the PIPE market grows, it is important to examine the direction and magnitude of the economic contribution from the world of private placements.

This research aims to add new insights in this field of research, and give a better understanding of the effects and effectiveness of the PIPE market. This study uses factors such as industry, firm and transaction characteristics to explain the outperformance or underperformance of private placements. Moreover, the study also examines the effects from asset structure within firms and from the security type used in the private placement transactions on the economic success of these private placements. Consequently, this research studies the influence of management on funding decisions, and find out in which context these can be perceived positive.

This paper uses the U.S. data from 1996 to 2005 (Thomson One Banker and CRPS) to investigate the duration before and after the 2000 stock market bubble. The choice of the study period is to avoid the emergence of the new global crisis in 2008 which still remains. Another reason is that we could have legal access to the data in this period while one of the authors was doing research in Europe.

2. Theoretical framework and hypotheses

2.1. Background on private placements

In general, management is assumed to know more about the value of the firm than potential investors. Because of this information asymmetry, managers have an incentive to use windows of opportunity to issue equity, that is, when the company is most overvalued. Empirical studies document that companies which issue common shares perform significantly worse after the issue than companies who do not issue (Loughran and Ritter, 1995). This implies that an equity issue in general is a bad news for shareholders. A public stock issue announcement is perceived as a signal of overvaluation of the firm, and the stock price will fall. Hence, the management has a tendency to forego stock issues and possible profitable investment opportunities. Only if the management can convey their 'insider information' to the market at no cost, this information asymmetry problem can be solved (Majluf and Myers, 1984). The

problem of information asymmetry is likely to be higher in firms with a high degree of intangible assets, as the profitability, or at least the market value of these assets cannot be easily measured.

A way out of the underinvestment problem can be the use of private placements. A private placement is negotiated with a single investor or a group of investors. These private equity issues can be seen as a signal of undervaluation, because private placement investors place a lot of risk in their investment due to the illiquid nature of private equity, so they have to be confident about the true value of the company. Therefore, there is often a process of thorough 'due diligence' before a private equity transaction, so that the private placement investors have better information about the true value of the company on average (Hertzel and Smith, 1993). In addition, as ownership concentration changes, private equity issue announcements give a signal of greater commitment of the management to the company, as the company is perceived to be better monitored. Consequently, it is assumed that this improves managerial performance, which is also known as the *ownership effect* (Wruck, 1989).

There are also indirect strategic advantages to private placements for the issuing firm, mostly connected to specific *niche* markets. For instance, private equity can be argued as a 'way out' for firms with a lot of intangible assets (e.g. R&D, human capital) and uncertain future growth. With a big information asymmetry about growth, these firms cannot issue common equity or debt for funding. However, as private investors often have more 'inside information' in these markets, a private placement transaction will signal that the firm has good future opportunities (Folta and Janney, 2004). Consequently, there is empirical evidence for the fact that young firms can attract more subsequent funds in more favourable conditions if they have committed investors with good reputations. Apart from the expectation that the company has a higher quality, the market perceives these firms as better analysed, and more transparent (Folta and Janney, 2006).

The most important limitation of private placements is the high direct cost, as they are sold with a substantial discount on average. Wruck (1989) mentions that this discount is the result of the ownership effect; as monitoring will cost the private investors extra time and money which they have to be compensated for. According to Hertzel and Smith (1993), private equity is often sold with substantial discounts due to the information costs incurred by the private investors. They show that the harder it is to assess the true value of the company for the private investor, the bigger the discount. Silber (1991) argues that these discounts are the result of the illiquidity attached to the private placements. Private placements are often held in large chunks and not easily resold (partly due to law restrictions), and therefore, in the business for a long-term, therefore enhancing involved risks. Because these direct costs of private placements are high, firms are only likely to choose private placements when there is a high information asymmetry, especially about growth opportunities.

2.2. Hypotheses

Based on the standards of prior studies and relevant arguments on private placements, we propose to test several hypotheses. First of all,

we think that the long-term negative effects of private placements found by Hertzel et al. (2002) can be the result of the distortive effect from private placements with convertibles (Hillion and Vermaelen, 2004). This specific nature of the transaction is a factor that has not been taken into account in previous studies. Therefore, it is interesting to figure out what are the long-term and short-term stock returns for firms using private placements if we separate them according to different issue types. We test Hillion and Vermaelen's (2004) distortive effect by expecting that the common equity issuing firms will outperform convertible issuing firms. Accordingly, we propose the following hypothesis:

Hypothesis 1: The stock return of firms which conduct a private placement with common equity is more positive than the stock return of firms which conduct a private placement through the use of convertibles.

Another factor which needs to receive some clarification lies in the relation between the manager and the investor. For instance, Wu (2004) finds that private investors on average do not monitor firms more closely than common equity holders, in contrast to the expected ownership effect proposed by Wruck (1989). One could argue that this is the effect of choice by management in attracting additional funds. If management has a choice in this matter, then a PIPE transaction is a likely signal that management want entrench themselves against hostile takeovers (Barclay et al. 2001). However, Folta and Janney (2004) stress the effect of a PIPE transaction on the mitigation of the information asymmetry of companies with high uncertain future growth. These companies do not have a choice in funding but only probably the private investor, as other investors find these companies too risky. For instance, firms in young, high technology industries, that is, 'new economy', have a lot of intangible assets, e.g. R&D, and a big information asymmetry about future growth. Therefore, a private placement will give the 'undervaluation signal', because of the confidence displayed by the private investors. Apart from contributing money to the cause of the firm, a private placement gives information to the market about the viability of the intangible assets of the firm. This is especially true in times of market distress, for instance after a bubble crash, when common investors are very sensitive to every information which can make a distinction between firms with a profitable future and 'lemons'.

According to Chauvin and Hirschey (1993), intangible assets have a positive impact on the valuation of the firm in the long-term, when forecast errors are more likely to be mitigated. Firms get their comparative advantage over other firms because of their investment in their intangible assets, which will give the firm specific knowledge that cannot be copied easily. Firms with a high relative investment in R&D and advertisement are proven to be able to outperform the market as a whole (Ballester et al., 2003). We get to the following hypothesis:

Hypothesis 2: The stock return of high technology (high intangible ratio) firms which take part in private placements is more positive than the stock return of high technology firms which do not take part in private placements.

Firms in more mature industries, like automobile industries for instance, have relatively more tangible assets and are

more likely to be a target for a takeover, as growth and investment opportunities in these markets are easier to predict. Because these firms have less uncertainty, they have more choices in funding. It can be expected that a PIPE transaction is the result of entrenchment motives, in order to prevent the takeover treat for the incumbent management. As these firms on average follow market returns, firms in these industries which take part in a private placement are likely to underperform. This results in the third hypothesis:

Hypothesis 3: *The stock return of firms in industries with a high intangible ratio that take part in private placements is more negative than firms in these industries which do not take part in private placements.*

Besides testing the above-mentioned hypotheses, we explore the difference in discount (if any) between the subsamples. In theory, no meaningful assumption can be made about the differences in discount, as both entrenchment theory and information asymmetry theory predict a sizeable discount.

3. Data and methodology

3.1. Data description

Thomson One Banker for companies which issued private placements during the period 1996-2005 is our main dataset. A private placement is defined as an issue in one block of more than 5% of the firm's outstanding shares to an entity, outside the common channel of the stock market exchange. After this transaction, the firm has to keep their listing on the stock exchange. Only firms conducting their first private placement were selected, or firms which have not conducted a private placement for the past three years. Every firm only occurs once in the total sample. Consequently, every firm is checked for available stock price data at the CRSP database. A total full sample of 1,158 firms is found. We eliminate firms with a stock price below one dollar at the time of issue (because there is a strong link between private placements and firms in distress). After the bubble crash in 2000, we observe a surge in the amount of private placements, especially at times when the stock price of firms was very low. Firms with negative book equity are excluded from the sample.

From the full sample of 1,158 companies, 428 companies (37%) have issued convertible type of securities in the private placement. As mentioned before, convertible securities can have a tendency to distort the validity of this research due to their manipulative nature. Therefore, it is informative to start to look at the full data sample first. Afterwards, the differences between the two distinctive types of security with their influences on the data sample are verified.

The majority of firms in the full sample (63%) conducting private placements are NASDAQ firms. Furthermore, from the total sample of the period 1996-2005, 83.9% (971 firms) made a private placement after the year 2000. These percentages are not substantially different in convertible and common equity issuing firms. The average amount of proceeds for the total sample is $32.69 million, with a median of $12.00 million. The average market value is $466.24 million (median: $92.10 million), and the average book-to-market ratio is 0.37 (median: 0.27). So, firms which take part in private placements are rather small, low book-to-market firms. The low medians show that the sample is skewed to even smaller, lower book-to-market firms.

Table 1: Sample characteristics of private placements

	No. obs	%	Market value (millions US$)		Book-to-market ratio		Average amount of proceeds (millions US4)	
			Mean	Median	Mean	Median	Mean	Median
Full sample	1158	100	466.24	92.10	0.37	0.28	32.69	12.00
Sub-sample by common equity issue	730	63	515.43	111.48	0.32	0.21	28.38	12.60
Sub-sample by convertibles issue	428	37	357.22	53.08	0.48	0.41	45.14	11.00

The sub-sample of private placements by convertibles has even a smaller average market value. However, the average book-to-market ratio of this sample is higher than the average book-to-market ratio of the total sample. The average amount of proceeds is the highest in the sub-sample of convertibles as well, emphasizing that these are indeed the type of firms which need large capital injections. However, having the lowest median shows that the variance in this sample is rather big, and that the majority of firms have relative small capital injections.

Table 2 shows that a major part of the private placements are in the high technology industries and in the healthcare orientated industries. There is no significant distinction between the relative number of the common equity issuing companies and convertible issuing companies in each industry.

Table 2: Industry distribution of private placements

Industry	Security type		Total
	Common equity	Convertibles	
Consumer Products and Services	63	36	99
Consumer Staples	15	4	
Energy and Power	55	29	84
Biotechnology	71	14	85
Pharmaceuticals	85	29	114
Other Healthcare	90	47	137
High Technology	189	146	335
Industrials	45	29	74
Materials	36	14	50
Media and Entertainment	16	20	36
Retail	23	19	42
Telecommunications	42	41	83
Total	730	428	1158

3.2 Methodology

In order to test the research hypotheses, an event study is used. The announcement effect is measured by the discount adjusted abnormal stock return (AR_{adj}) method. This method is well established, and also used by Hertzel and Smith (1993) for measuring the announcement effects for private placements. The stock returns of the firms in our sample are compared to a benchmark portfolio of firms with the same size and book-to-market characteristics. This abnormal return, the stock return difference between the sample and the benchmark, will then be adjusted for the discount provided in the placement. An interval of seven days (-7 to 0) will be sufficient for measuring the short-term stock returns. To check for robustness, we include three other event windows: (-13 to 0), (-3 to 0) and (-1 to +7), also used by Wruck (1989) and Hertzel and Smith (1993).

The AR_{adj} method, according to Bradley and Wakeman (1983), is described by the formula:

$$AR_{adj} = \frac{1}{1-\alpha} AR + \left(\frac{\alpha}{1-\alpha}\right)\left(\frac{P_b - P_0}{P_b}\right)$$

where AR is the abnormal stock return, α is the ratio of shares placed to shares outstanding after the placement, P_b is the market price before the event window and P_o is the selling price of the placement. The selling price of a convertible is calculated by dividing the total selling price by the total amount of implicated shares sold.

For calculating the discount, the following formula is used:

$$Discount = \begin{pmatrix} \text{Price at announcement day} \\ +13 \text{ days} - \text{Placement Price} \end{pmatrix} / \begin{pmatrix} \text{Price at announcement day} \\ +13 \text{ days} \end{pmatrix}$$

The long-term effects will be examined by measuring the long-term abnormal return through the calendar-time portfolio approach advocated by Fama (1998). The calendar-time portfolio approach implies that all private equity issuing firms from three years hence are put into a portfolio and matched to a benchmark for every month in the time span. In this way the cross sectional dependence of the abnormal returns is taken into account. The stock returns of the firms which take part in a private placement are put in an monthly portfolio after their private placement for three years or until they delist. A three year time-frame after the private placement is suitable, because according to the SEC rules, a private placement can be traded without restrictions after a holding period of three years.

The factors of size and book-to-market ratio are taken into account to increase the explanatory power of the regression (Fama and French, 1993). Small firms experience stronger effects (in both ways) of a private placement. A firm with a lower book-to-market ratio is more likely to underperform after a private placement. The calendar-time portfolio is then regressed by:

where R_{pt} is portfolio return for the month, R_{ft} is the risk-free rate, $R_{mt} - R_{ft}$ is the excess return for the market, SMB appeals to the size difference and HML to the difference in book-to-market ratio. The intercept α will

[1] http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html

then indicate the abnormal performance of the stock (Fama and French, 1993). The factors are taken from the website of Kenneth French[1].

However, the three-factor model is not fully capable in describing the abnormal returns for low size, low book-to-market firms (Mitchell and Stafford, 2000). Therefore we construct benchmark portfolios of non-event firms which have the same average size and book-to-market ratio as our samples. Our portfolio intercept α is then corrected by the benchmark intercept αb. After this, a new t-statistic is calculated according to the following formula:

$$t = (\alpha - \alpha b)/s$$

in which *s* is the standard error from α. This will result in an *adjusted* α, which describes more accurately the abnormal returns of our portfolios. This is confirmed by the study of Ferreira and Brooks (2006), who find evidence that the adjusted α is better able to describe accurately abnormal returns for private placements than the normal α.

The portfolios that belong to the sample of private placements by common equity are further split into sub-samples according to the average intangible asset/total asset ratio in each industry. These ratios are taken from Nelson (2006). The top industries measured by intangible asset/total asset ratio measured by Research & Development costs, according to Nelson (2006), are the Pharmaceutical/ Biotechnology industry, the Software industry and the Electronic equipment industry. We make two portfolios for high R&D ratio industries, one containing the Biotechnology/ Pharmaceutical industries, and the other portfolio containing the Software industry. We expect to see variations because business models for firms in the biotechnology/ pharmaceutical industry and software industry (dotcom firms) are highly different. We also create a portfolio from industries with the highest average advertisement assets: the high advertisement portfolio, consisting of the Entertainment industry and the Consumer retail industries. Some of the industries with the lowest ratios are the Commodities industry, the Oil and Gas industry and the Material industry. All these industries form an 'old economy' portfolio.

Finally, our regressions are linked to other data, like the discount given to the private investor between industries. Another interesting factor to explore is the influence of the stock bubble crash in the field of private placements. This 'new economy' crash of 2000 is an important consideration to take into account. It will have implications for the second hypothesis, as the high technology stocks have suffered terribly because of this crash. However, the high technology companies with potentials were the ones who could take part in a private placement at the time. Therefore, the information asymmetry effect is more likely to strengthen from 2000 onward.

4. Empirical Findings

4.1. Stock performance after private placements by issue characteristics

+ Short-term effects and discounts

The short-term effects are measured by the discount adjusted abnormal return method. As can be seen from Table 3, the announcement abnormal returns are positive, but not very big. Only the sample by convertibles has some significant substantial announcement effects, considerably when adjusted for the discount. It is clear that the

companies which issue private placements with convertibles have the strongest reaction, also because of the higher relative discount and the higher average ratio of shares placed. This is probably the effect of the relative smaller size of these companies, and the higher book-to-market ratios. In short, these are possibly firms in financial distress, and experience a surge in stock price when this state of being is momentarily relieved by the arrival of external financing. Furthermore, it is noted that these companies have a higher discount than the sample by common equity. A possible explanation for this is the compensation for the higher risk perceived, even more so because the average ratio of shares placed is relatively higher. Regarding the sample by common equity, the abnormal return is negligible, which is rather in contrast to the undervaluation signal theory. Underreaction in the market can be a plausible reason for this; however, the sample by convertibles does not go along with this line of reasoning.

These positive short-term effects have been found by Wruck (1989) and Hertzel and Smith (1993). The robustness check shows that there is a tendency for the sample by common equity to have an increasing positive announcement effect if the timeframe is shifted after the announcement. However, this pattern is not observed in the sample by convertibles. Besides the factor of underreaction, we think this is due to the fact that more different kinds of companies (i.e. more financial distressed firms) take part in convertibles than firms issuing common equity. Also, the nature of the transaction could have been not clear before the announcement, but when it became public, the negative long-term stock performance of the private placements with convertibles versus the positive long-term stock performance of common equity can be the influence of this pattern.

Table 3: Announcement effects of private placements by issue type

By using the discount adjusted abnormal stock return (AR_{adj}) method, we identify the announcement effects from private placements in our sample. The formula used for calculating the announcement effect is $AR_{adj} = (1/1-\alpha))AR+(\alpha/(1-\alpha))((Pb-Po)/Pb)$, in which AR is the abnormal stock return, α is the ratio of shares placed to shares outstanding after the placement, P_b is the market price before the event window and P_o is the selling price of the placement. For calculating the discount the formula used: Discount = (Price at announcement day+13 days - Placement price)/(Price at announcement day+13 days). We make a distinction in security type, from which sub-samples are formed. We use four event windows: (-13, 0), (-7, 0), (-3, 0), and (-1, 7). The abnormal return is significant when marked by * (at the 5% level).

	Average discount (%)	Average ratio of share placed	Announcement period abnormal return (%)				Discount adjusted abnormal return (%)			
			-13,0	-7,0	-3,0	-1,7	-13,0	-7,0	-3,0	-1,7
Full sample	9.04%	0.09	1.28%	1.40%	1.24%	1.89%	2.30%	2.43%	2.26%	2.97%
Sub-sample by common equity	6.07%	0.07	0.52%	0.62%	0.47%	1.82%	1.02%	1.12%	0.96%	2.41%
Sub-sample by convertibles	14.09%	0.12	2.58%	3.17%*	2.54%*	2.01%	3.23%	3.87%*	3.19%*	2.62%

+ Long-term effects issue types

For measuring the long-term performance for these samples, the Fama French three-factor model is used. However, because this model is not fully capable to describe the null hypothesis for small, low book-to-market firms (Mitchell and Stafford, 2000), we conduct a benchmark portfolio of non-event firms with the same size and book-to-market ratio, then the intercept, α, is adjusted with the expected intercept of the benchmark portfolio[2]. Portfolio months with less than 10 observations were omitted from the regression, in order to mitigate the heterokedasticity problem addressed by Mitchell and Stafford (2000).

Table 4: Long-term effects of private placements by issue type

In Panel A are the results when the portfolios are value weighted. In Panel B are the results when the portfolios are equally weighted. The t-statistic is significantly different from zero at the 5% level, marked by*.

Panel A: Value Weight				
	α (t-statistic)	**Adjusted α** (t-statistic)	**Adjusted R^2 (N)**	**Implied three-year adjusted AR (%)**
Full sample	0.524 (0.928)	0.432 (0.765)	0.638 (108)	15.55%
Sample by common equity	1.262 (2.290)*	1.144 (2.076)*	0.610 (108)	41.18%
Sample by convertibles	-0.883 (-0.959)	-0.925 (-1.004)	0.524 (108)	-33.30%
Panel B: Equal Weight				
	α (t-statistic)	**Adjusted α** (t-statistic)	**Adjusted R^2 (N)**	**Implied three-year adjusted AR (%)**
Full sample	0.803 (1.211)	0.755 (1.013)	0.591 (108)	27.18%
Sample by common equity	1.115 (1.487)	1.076 (1.435)	0.572 (108)	38.74%
Sample by convertibles	-0.712 (-0.733)	-0.760 (-0.783)	0.502 (108)	-27.36%

As can be seen from Table 4, there is a substantial difference in long-term stock performance between companies which conducted private placements with common equity and companies which conducted private placements with convertibles. However, only the value weighted sample by common equity shows a significant adjusted α of 1.144, with significance level at 5% (t-statistic = 2.076). This implies a three-year average abnormal return of 41.18%. The equal weighted abnormal return for this sample is not significant, so it appears that the bigger firms are more likely to outperform

[2] The sample of common equity has a different benchmark than the others.

than the smaller firms. It is noted that the full sample does not show the negative abnormal performance documented by previous studies. Overall, there is a tendency of the common equity sample to outperform (consistent with our Hypothesis 1). This is line with the expectations, and follows the implications of convertibles in private placements from the study by Hillion and Vermaelen (2004).

4.2. Stock performance after private placements by industry characteristics

+ Industry characteristics

We partition the sample in different industry groups, according to the average intangible assets relative to total assets in each industry. We form four kind of specific portfolios: two 'high-R&D' portfolios, one 'advertisement' portfolio, and one 'old economy portfolio'. Because not all companies of the total common equity sample belong to one of these four groups, we form the fifth portfolio consisting of the rest of the firms. Table 5 shows the different industry groups in each portfolio.

Table 5: Sample of Private Placements by Industry Characteristics

Portfolio	Industry group(s)	N	Average intangible assets / Total assets	Market Value (millions US$)		Book-to-Market	
				Mean	Median	Mean	Median
High R&D Healthcare	Biotechnology Pharmaceuticals	156	0.36	378.62	168.43	0.23	0.19
High R&D Software	High Technology	189	0.33	267.18	92.29	0.28	0.21
Advertisement	Media &Entertainment Retail Consumer Staples	54	0.24	333.77	109.76	0.24	0.20
Old Economy	Energy & Power Industrials Materials	136	0.13	775.42	182.63	0.44	0.37
Residual	Consumer Products & Services Other healthcare Telecommunications	195	0.18	599.83	164.99	0.33	0.27
Total		730	0.25	515.43	111.48	0.32	0.21

As in Table 5, the number of companies for each portfolio is relatively similar, with the exception of the advertisement portfolio. For calculating the intangible asset/total asset ratio, only the available data at CRSP is used. No data was available for around 50% of the firms of this sample. The High R&D portfolio consisting of Biotechnology

and Pharmaceutical firms has the highest intangible asset/total asset ratio of 36%. Also, its book-to-market ratio is the lowest. The old-economy portfolio has the lowest intangible asset/total asset ratio of 13%. This portfolio has also the highest market value and the highest book-to-market ratios.

+ Short-term industry effects and discounts

The different portfolios are measured by the discount adjusted abnormal return method. As Table 6 shows, the announcement effect in the high intangible industries is (sometimes) significantly positive, while in the old economy it is slightly negative. This is possibly due to the fact that the high intangible industries are more volatile and therefore more likely to have a stronger effect on any announcement. The average ratio of shares placed is also the highest in the High R&D portfolios. The discount is the highest on average in the old economy portfolio, which can be due to entrenchment enabling compensations. However, it is also likely that because of the smaller impact the private placements have on these portfolio industries, and therefore investors need an extra compensation in relation to the lower relative amount of volatility if we look at the other portfolios.

Considering the total pattern for different event windows, the effect for the two High R&D portfolios is stronger after the announcement. In fact, this pattern is observed for the other portfolios as well (except for the advertisement portfolio). In this case, this might be due to the factor of underreaction. In general, these positive announcement effects are in conjunction with the findings of Wruck (1989) and Hertzel and Smith (1993).

Table 6: Announcement effects of private placements by industry

We use four event windows: (-13, 0), (-7, 0), (-3, 0), and (-1 ,7). The abnormal return is significant when marked by * (at the 5% level).

Portfolio	Average discount (%)	Average ratio of share placed	Announcement period abnormal return (%)				Discount adjusted abnormal return (%)			
			-13,0	-7,0	-3,0	-1,7	-13,0	-7,0	-3,0	-1,7
High R&D Healthcare	3.72%	0.08	1.13%	1.01%	1.40%	2.55%*	1.55%	1.42%	1.84%	3.10%*
High R&D Software	6.68%	0.10	1.76%	2.54%*	1.45%	3.23%*	2.70%	3.56%*	2.35%	4.33%*
Advertisement	4.21%	0.08	1.45%	0.86%	1.01%	0.65%	1.94%	1.30%	1.46%	1.07%
Old Economy	9.19%	0.06	-0.33%	-0.65%	-0.44%	0.34%	-0.24%	-0.11%	-0.12%	0.94%
Residual	4.78%	0.06	-0.85%	-0.72%	-0.73%	1.23%	-0.60%	-0.46%	-0.47%	1.61%
Total	6.07%	0.07	0.52%	0.62%	0.47%	1.82%	1.02%	1.12%	0.96%	2.41%

+ Long-term industry effects

The results of the regressions are in Table 7. It documents that both High R&D portfolios are significantly outperforming the stock market. The High R&D Healthcare portfolio has an adjusted α for the Value weighted portfolio of 2.795 (t-statistic = 3.420) and an adjusted α for the Equal weighted portfolio of 2.306 (t-statistic = 3.068). This implies substantial three-year adjusted abnormal average returns, 100.62% and 83.02% respectively.

Table 7: Long-term Effects of Private Placements by Industry

In Panel A are the results for when the portfolios are value weighted. In Panel B are the results for when the portfolios are equally weighted. The t-statistic is significantly different from zero at the 5% level, marked by*.

Panel A: Value weight				
Portfolio	**α (t-statistic)**	**Adjusted α (t-statistic)**	**Adjusted R^2 (N)**	**Implied three-year adjusted AR (%)**
High R&D Healthcare	2.887 (3.533)*	2.795 (3.420)*	0.516 (94)	100.62%
High R&DSoftware	2.381 (2.511)*	2.289 (2.414)*	0.542 (95)	82.40%
Advertisement	0.192 (0.212)	0.100 (0.110)	0.417 (54)	3.60%
Old Economy	-0.309 (-0.511)	-0.183 (-0.303)	0.550 (98)	-6.59%
Residual	1.388 (1.243)	1.270 (1.137)	0.362 (87)	45.72%
Total	1.262 (2.290)*	1.144 (2.076)*	0.610 (108)	41.18%
Panel B: Equal weight				
Portfolio	**α (t-statistic)**	**Adjusted α (t-statistic)**	**Adjusted R^2 (N)**	**Implied three-year adjusted AR (%)**
High R&D Healthcare	2.354 (3.132)*	2.306 (3.068)*	0.503 (94)	83.02%
High R&D Software	2.615 (2.034)*	2.567 (1.997)*	0.559 (95)	92.41%
Advertisement	0.351 (0.407)	0.303 (0.351)	0.431 (54)	10.91%
Old Economy	0.478 (0.776)	0.649 (1.054)	0.562 (98)	23.37%
Residual	1.543 (1.112)	1.504 (1.084)	0.267 (87)	54.14%
Total	1.115 (1.487)	1.076 (1.435)	0.572 (108)	38.74%

Regarding the High R&D Software portfolio, we find an adjusted α for the Value weighted portfolio of 2.289 (t-statistic = 2.414), while for the Equal weighted portfolio an adjusted α of 2.567 (t-statistic = 1.997). For this portfolio, the three-year adjusted abnormal average returns are 82.40% and 92.41%. For the other portfolios we find no significant results. The low R^2 for the high advertisement portfolio and especially the residual portfolio is remarkable. A reason for the low power of the samples can be the fact that these companies are highly volatile, and the occurrence of the bubble crash in the sample years when

there was a lot of irrationality in the market. These results confirm our second hypothesis, but reject our third hypothesis. However, the result confirms the theoretical model of signalling from private placements, and the positive effects private placements can have on the mitigation of information asymmetry. The entrenchment theory, the basic of the third hypothesis, is not confirmed.

4.3 Impact of the market bubble

It is likely that the companies in our samples are severely influenced by the occurrence of the stock market bubble and its consequent crash in the sample period. As can be seen from the summary statistics, the number of private placements increased dramatically after the bubble crash. Henceforth, there is big difference in event activity within the total sample period 1996-2005. We split the samples into further sub-samples: before and after the crash. We define the beginning of the bubble crash in March 2000.

Table 8: Long-term effects by issue type before and after the bubble

This table reports the long-term abnormal stock performance of the sample, as split by issue type, for the pre-bubble crash period and the after-bubble crash period. For each month, we form portfolios for firms which issued equity privately within the last three years. Value weighted returns are shown under 'VW', Equal weighted returns are shown under 'EW'. The t-statistic is significantly different from zero at 5% level, marked by *****.

Pre-Bubble Crash						
	α (t-statistic)		**Adjusted α (t-statistic)**		**Adjusted R^2 (N)**	
	VW	**EW**	**VW**	**EW**	**VW**	**EW**
Full sample	-0.477 (-0.474)	0.113 (0.080)	-0.648 (-0.644)	0.080 (0.056)	0.479 (41)	0.459 (41)
Sub-sample by common equity	0.117 (0.125)	0.372 (0.261)	-0.522 (0.558)	0.051 (0.036)	0.465 (41)	0.444 (41)
Sub-sample by convertibles	-2.352 (-1.580)	-1.662 (-0.874)	-2.523 (-1.696)	-1.695 (-0.892)	0.439 (41)	0.418 (41)
After-Bubble Crash						
	α (t-statistic)		**Adjusted α (t-statistic)**		**Adjusted R^2 (N)**	
	VW	**EW**	**VW**	**EW**	**VW**	**EW**
Full sample	0.892 (1.622)	1.044 (1.716)	0.949 (1.725)	0.498 (0.819)	0.798 (67)	0.805 (67)
Sub-sample by common equity	1.562 (2.512)*	1.325 (2.207)*	1.914 (3.077)*	1.210 (2.017)*	0.615 (67)	0.804 (67)
Sub-sample by convertibles	0.163 (0.150)	-0.562 (-0.552)	0.220 (0.203)	-1.108 (-1.097)	0.564 (67)	0.580 (67)

Table 8 shows that there is a large difference between these two time periods. Almost all samples are underperforming in the pre-bubble crash period, however not significantly. In any case, they are not outperforming the market. The sub-sample for the after-bubble period is a different story. No portfolio seems to underperform, and the portfolio by common equity is significantly outperforming the market in this period, both value-weighted and equal weighted. We find that the portfolio by convertibles is at least not underperforming for this period, in any case not if value weighted.

The power of the regressions for the after-bubble crash period is stronger, due to the relative higher number of observations. There was clearly a higher correlation with the average market factors than in the pre-bubble crash period.

We, next, split the portfolios in a pre-bubble crash period and an after-crash period. We omit the high advertisement portfolio from this sample due to the lack of observations. Because of irrelevance, we also omit the portfolio with the residual industries. The results show that the bubble crash did not seem to have a big effect on Biotechnology and Pharmaceutical companies. Both before and after the bubble crash, they are outperforming the benchmark portfolio, however not significantly.

The high technology stocks do not perform badly before the bubble crash when taking part in a private placement, but they are, if

Table 9: Long-term Effects by Industry Before and After the Bubble

Value weighted returns are shown under 'VW', Equal weighted returns are shown under 'EW'. The t-statistic is significantly different from zero at 5% level, marked by *.

Pre Bubble Crash						
Portfolio	**α (t-statistic)**		**Adjusted** α (t-statistic)		**Adjusted R^2 (N)**	
	VW	**EW**	**VW**	**EW**	**VW**	**EW**
High R&D Healthcare	1,066 (0,886)	1,308 (0,839)	0,895 (0,744)	1,275 (0,818)	0,355 (40)	0,303 (40)
High R&DSoftware	0,832 (0,526)	1,254 (0,899)	0,661 (0,418)	1,221 (0,875)	0,309 (38)	0,305 (38)
Old Economy	-0,578 (-0,353)	0,104 (0,078)	-0,219 (-0,134)	0,562 (0,422)	0,422 (35)	0,445 (35)
After Bubble Crash						
Portfolio	**α (t-statistic)**		**Adjusted α (t-statistic)**		**Adjusted R^2 (N)**	
	VW	**EW**	**VW**	**EW**	**VW**	**EW**
High R&D Healthcare	1,870 (1,455)	1,803 (1,619)	1,927 (1,500)	1,257 (1,129)	0,490 (66)	0,590 (66)
High R&D Software	2,883 (2,103)*	2,115 (1,678)	2,940 (2,145)*	1,569 (1,245)	0,508 (67)	0,647 (67)
Old Economy	-0,438 (-0,770)	0,459 (0,858)	-0,274 (-0,482)	0,352 (0,658)	0,522 (66)	0,675 (66)

value weighted, significantly outperforming the market after the bubble crash. This can be explained by the clear signals private placement can give about the viability of these kind of companies (a lot of dotcom companies with a relative high amount of intangible assets) for the future. The benchmark portfolio has the trouble that it incorporates companies which have lost the battle of the dotcom boom, and therefore it is logical that the companies in this industry which took part in a private placement (with common equity) are outperforming, as these are the ones with a profitable future on average. When adjusted, there is a rather large difference in α between the value weighted and equal weighted portfolios. Apparently, this is due to the size effect.

Concerning the Old Economy portfolio, there is not a significant difference between the pre-bubble period and the after-bubble period. This portfolio is mostly following market returns.

5. Discussions and conclusions

In this study, we look for factors influencing the stock performance of firms which choose external financing by the use of private placements. The factors include firm, industry and market dimensions, as well in the private placement characteristics itself. In specific, there are three main factors in the framework of private placements to be examined in this paper: the issue type in the private placement, the intangible asset/total asset ratio in the firm and the effect of the bubble crash from the beginning of the millennium.

We find evidence that the issue type in a private placement is an important factor affecting the stock performance of the firm. Convertibles are at least not helping to perform better than average, while a private placement by common equity is more likely to outperform the market. Regarding the influence of industry/firm characteristics, we find evidence that the intangible asset/total asset ratio in the industry is a good indicator for the strength of the information signal connected to a private placement. Firms with a relatively higher amount of intangible assets than the market norm experience stronger information signals than firms with relatively lower amount of intangibles assets. It is clear that the reduction in information asymmetry pays off for the 'good' firms, the firms with viable future prospects. This paper shows that private placements can be helpful in order to diminish information asymmetry, and give an undervaluation signal to the market. On the other hand, we find no evidence for the entrenchment theory. Firms with low intangible assets do follow market returns after a private placement, and at least do not perform worse regarding their stock returns. For these kinds of firms, a private placement is not used as an information signal, but more as another way of external financing. It can be that private placements in these kinds of industries are directed toward more affiliated investors, and that there is a factor of irrationality.

A lot of firms see private placements as the only way out in financing, in which they often have to accept conditions which are not really positive for the firm in the long-term. So it is important to make a distinction between firms which have the choice of a private placement as an alternative to common equity financing, and firms in financial distress which do not really have a choice at all.

The study shows no evidence for the managerial entrenchment motive. However, we find that the undervaluation signal theory is viable. Especially when we take the conditions of the transaction into account, relatively high intangible firms issuing common equity privately show a significant outperformance to their peers. Three factors may explain this inconsistency with previous papers. First, the nature of the industry, which has changed over time. The relative ratio of intangible assets to total assets has increased severely during the study period, which could have strengthened the positive implications of the studied private placements in contrast to earlier ones. Second, the other studies did not take the nature of the transaction into account. Therefore, there was a distortive effect of market manipulation with the use of convertibles which could have contributed to the negative long-term effect. Third, the occurrence of the bubble crash may have changed the paradigm of the world of the private placements. It is highly likely that the information asymmetry influence has become much stronger after the bubble crash, and therefore mitigates these factors which were the main factors behind the negative long-term performance in the first place.

Finally, private placements are a complex matter. There are a lot of different factors playing in the field. One should be wary to attribute the positive effects found in this study with high R&D firms only to the private placement transactions. Our robustness checks show that these firms are also quite dependable on industry specific factors, like technological paradigm shifts. In addition, there are a lot of external factors at work, which are likely to have big influence on high R&D firms.❑

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